

PROPOSED Xerox Docket No. D/99052
Application No. 09/450,185

Amendments to the Specification

Please replace the paragraph beginning on page 1, line 23, with the following rewritten paragraph:

There is a need for image output devices, such as printers and copiers, to better self-diagnose problems relating to image quality. Applicants have found that to comprehensively and reliably measure the system performance of a printer or copier, the image quality of the output must be measured. More importantly, this image quality analysis should utilize models of the human visual system (HVS) such that not only physical characteristics of the image are analyzed, but the degree to which differences in certain image quality traits are perceived by human observers can be determined and taken into account when deciding which, if any, action to ~~take~~. ~~Automated take~~. Automated determination of image quality can also provide value to users of the printer in other ways than through self-diagnosis, for example as a tool of automating the monitoring of image quality as part of a quality assurance operation.

Please replace the paragraph beginning on page 7, line 33, with the following rewritten paragraph:

The test pattern can be one of several test patterns designed to provide evaluation of one or more parameters relevant to the image quality of the output of the printing system, such as color registration, motion quality, micro and macro uniformity, color correction, and text quality. This analysis is performed using models of human visual perception so that those differences that would be perceived by a human observer can be determined. That is, rather than having the analysis merely compare a scanned image to an original or to determine some level of variation or deviation from a given norm that may or may not rise to the level

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of a perceived image quality issue when viewed by a human observer, the image quality analysis utilizes human visual perception models. At a simple level, this can be achieved by passing the image through a band-pass filter known to be similar in resolution to that achieved by a human vision system. More sophisticated modeling can also be used. According to preferred aspects of the ~~invention~~, the invention, the results are preferably made to be independent of the marking technology, and of the scanner used to acquire the digital raster image for analysis, so results can be compared across product and model lines with a standard system of measurement and evaluation. An exemplary system and method to achieve this can be found in co-pending U.S. Ser. No. 09/450,183 to Rasmussen et al., filed concurrently herewith, entitled "Method to Obtain Consistent Image Quality Measurements From Different Image Input Devices", the subject matter of which is incorporated by reference herein in its entirety. In this co-pending application, a Modulation Transfer Function (MTF) is determined for a particular input device (scanner 20) and a Visual Transfer Function (VTF) is similarly expressed to take into account the sensitivity of the human visual system (HVS), which is usually lower from that of the typical input device. A Differential Transfer Function (DTF) can then be calculated at each spatial frequency reflecting the ratio of VTF to MTF. The scanned digital test image is then transformed according to the DTF to transform (mainly blur) the image to some extent from that achieved by the scanner such that this transformed image represents the image perceived by the human vision system (HVS).

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